Complete Summary

GUIDELINE TITLE

AAOS clinical guideline on osteoarthritis of the knee (phase II).

BIBLIOGRAPHIC SOURCE(S)

American Academy of Orthopaedic Surgeons. AAOS clinical guideline on osteoarthritis of the knee (phase II). Rosemont (IL): American Academy of Orthopaedic Surgeons; 2003. 15 p. [75 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Osteoarthritis of the knee

GUIDELINE CATEGORY

Evaluation
Management
Treatment

CLINICAL SPECIALTY

Orthopedic Surgery
Physical Medicine and Rehabilitation
Rheumatology

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

To guide qualified physicians through a series of diagnostic and treatment decisions in an effort to improve the quality and efficiency of care in patients with osteoarthritis of the knee

TARGET POPULATION

Skeletally mature individuals with confirmed osteoarthritis of the knee for whom conservative treatment has been ineffective

INTERVENTIONS AND PRACTICES CONSIDERED

Evaluation

1. Evaluation of patient (i.e., age, level of symptomology, impact of knee dysfunction or pain on quality of life, medical comorbidity, suitability for surgery)
2. Tests as indicated (magnetic resonance imaging [MRI] scan of knee; radiography of the knee)

Management/Treatment

1. Patient education and counseling on surgical procedures (i.e., expected outcomes, potential for risks, and complications)
2. Surgical options:
    - Total joint replacement
    - Knee fusion
    - Arthroscopic debridement
    - Total knee arthroplasty
    - Tibial osteotomy
    - Unicompartmental arthroplasty of the medial compartment of the knee
    - Distal femoral varus osteotomy
    - Procedure to elevate the tibial tubercle or a patellectomy
    - Patellofemoral arthroplasty

MAJOR OUTCOMES CONSIDERED

Efficacy of surgical treatment including:

- Quality of life
- Short-term and long-term success rates
- Patient satisfaction
- Pain relief
- Return of prior knee function (e.g., range of motion measurement, weight bearing, ambulation)

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Evaluation of Existing Guidelines: A search of MEDLINE, the National Guidelines Clearinghouse and the American Medical Association's Clinical Practice Guidelines Directory (1999) was performed. Only one relevant guideline was located. The American College of Rheumatology Subcommittee on Osteoarthritis Guidelines: Recommendations for the medical management of osteoarthritis of the hip and knee: 2000 Update, was reviewed by the work group.

Literature Review: A search of MEDLINE was performed in order to update the literature used to develop the original guideline. English language peer reviewed journals from 1990 to 2000 with human studies of adults over 19 years of age were included.

NUMBER OF SOURCE DOCUMENTS

75 articles were identified and reviewed

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Type I. Meta-analysis of multiple, well-designed controlled studies; or high power randomized, controlled clinical trial

Type II. Well-designed experimental study; or low-power randomized, controlled clinical trial

Type III. Well-designed, non-experimental studies such as nonrandomized, controlled single-group, pre-post, cohort, time, or matched case-control series

Type IV. Well-designed, non-experimental studies, such as comparative and correlational descriptive and case studies

Type V. Case reports and clinical examples

Consensus/opinion (as it is used in bibliography of the original guideline): Articles representing expert consensus and not meeting the rigid I-V measurement are noted to represent consensus/opinion.

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not applicable

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Consensus Development: The work group participated in a series of conference calls and meetings in which information was extracted and incorporated into the original algorithm. Information from the literature was supplemented by the consensus opinion of the work group, when necessary. Multiple iterations of the guideline were then completed and reviewed by work group members. Modifications (when supported by references from the literature) were then incorporated by the work group chairman.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Strength of Recommendation

The strength of the guideline recommendations for or against an intervention was graded as follows:

A. Type I evidence or consistent findings from multiple studies of types II, III, or IV

B. Types II, III, or IV evidence and findings are generally consistent

C. Types II, III, or IV evidence, but findings are inconsistent

D. Little or no systematic empirical evidence

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The guideline was reviewed and approved by various groups within the American Academy of Orthopaedic Surgeons (AAOS) including the Evidence Analysis Work Group, Evidence-Based Practice Committee, Council on Research and Scientific Affairs, Board of Councilors, and Board of Directors prior to publication.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Definitions for the ratings of the strength of recommendation (A-D) and the levels of evidence (Type I-Type V) are provided at the end of the "Major Recommendations" field.

Diagnosis

Osteoarthritis

Definition of the Problem

Osteoarthritis of the knee is an increasingly common problem due to a more active society, often leading to prior knee injuries, an increasingly elderly population, and a growing percentage of the population that is overweight. Osteoarthritis of the knee should be suspected when a patient presents with knee pain that has been longstanding, increases with activity, particularly weight bearing and stairs, and improves with rest. Onset of pain and dysfunction is often insidious. Deformity, fixed contracture, crepitance, and effusion are common findings. The differential diagnoses include inflammatory arthritis, bursitis or tendonitis, anterior knee pain, and internal derangement.

Patients entering Phase II of the guideline have failed to respond to conservative treatment. Pain, instability and function have not improved to a satisfactory level despite conservative treatment rendered, as outlined in Phase I of the guideline (see the National Guideline Clearinghouse (NGC) summary of the American Academy of Orthopaedic Surgeons [AAOS] guideline AAOS Clinical Guideline on Osteoarthritis of the Knee). This treatment may have included analgesics or nonsteroidal anti-inflammatory medications, activity modification including weight reduction, and therapeutic exercise. It may have included trial of durable medical equipment such as knee braces, ambulatory assistive devices, or orthoses. The patient may have undergone intra-articular injection in the knee with steroid or viscosupplementation.

Recommendations

For patients with osteoarthritis of the knee presenting to a musculoskeletal specialist, conservative treatment measures should have been exhausted. The age of the patient, level of symptomology, impact of knee dysfunction or pain on quality of life, and medical comorbidity should be assessed. If there is a medical contraindication to surgery, conservative treatment should be continued. The diagnosis of neuropathic arthropathy should be considered. The role for surgical intervention, including arthroplasty, is not well defined for a neuropathic joint ("D" Recommendation).

If a patient without a medical contraindication to surgery or neuropathic joint remains dissatisfied with the outcome of conservative care and has significant knee dysfunction, pain, or both, surgical alternatives should be considered.

Evaluation by an orthopaedic surgeon is appropriate. Referral by a rheumatologist or physiatrist to an orthopaedic surgeon is indicated.

Previous Knee Infection or Osteomyelitis

For a patient with osteoarthritis that has failed to respond to conservative treatment and had a previous infection involving the knee, staged total knee replacement or knee fusion should be considered ("D" Recommendation). The choice to proceed with surgery, and between the two options, should be based on the patient's age, activity level, occupation, and a discussion. The discussion should include the natural history of the underlying condition including short- and long-term pain and physical impairment expectations with and without surgery. The efficacy of the proposed surgical procedure should be discussed. The risks and possible complications of each treatment option and reasonable expectation and timeframe to accomplish the expected outcome should be discussed.

Total joint replacement is contraindicated in the presence of active infection. When there is a history of infection, preoperative aspiration is often indicated. The risk of infection remains 10% or greater when total knee arthroplasty is performed even in the presence of infection in the distant past ("D" Recommendation). In a young patient with history of chronic infection, knee fusion should be considered ("D" Recommendation). Good results have been reported in total knee arthroplasty in patients under 55 years of age ("B" Recommendation).

Knee fusion may be considered in young, active, high demand patients with isolated bi- or tri-compartmental degenerative arthritis, particularly when associated with severe knee instability.

Patients Without Significant Joint Space Narrowing

Weight bearing standing anterior to posterior (AP) radiographs of the knee should be taken ("A" Recommendation). A lateral view of the knee joint and view tangential to the patellofemoral joint should be obtained. A standing radiograph, taken from posterior to anterior, with the knee flexed 45 degrees can show loss of cartilage in the posterior aspect of the knee ("A" Recommendation).

If there is suspicion of avascular necrosis (AVN) involving the knee, a magnetic resonance imaging (MRI) scan may be performed. If MRI confirms the presence of avascular necrosis in older patients, with extensive involvement of the condyle, total knee arthroplasty is often indicated ("B" Recommendation). Younger patients with more localized involvement may be candidates for a lesser procedure ("C" Recommendation).

If avascular necrosis is not present and there is not significant joint space narrowing, arthroscopic debridement can be considered. Arthroscopic debridement may be indicated for the treatment of patients with degenerative arthritis with mechanical symptoms ("B" Recommendation). Neither arthroscopic lavage nor debridement is indicated for patients without mechanical symptoms ("A" Recommendation). Results of arthroscopic debridement in patients with mechanical symptoms are variable, but high success rates are reported when

there is not gross malalignment or instability, there is some articular cartilage remaining, and symptoms are well localized ("B" Recommendation).

Abrasion or drilling has not been shown to have added benefit ("C" Recommendation). Careful patient selection is required. "For the subgroup of knees with loose bodies or flaps of meniscus or cartilage that are causing mechanical symptoms, especially locking, catching, or giving way of the joint, there is a consensus that arthroscopic removal of these unstable tissues improves joint function and alleviates symptoms." (Felson DT, Buckwalter J; Editorial: Debridement and lavage for osteoarthritis of the knee, New Eng J Med, 347(2):132-3.)

If arthroscopic debridement for osteoarthritis of the knee is considered, a discussion with the patient should include the natural history of the underlying condition including short- and long-term pain and physical impairment expectations with and without surgery. The efficacy of the proposed surgical procedure should be discussed. The risks and possible complications of each treatment option and reasonable expectation and timeframe to accomplish the expected outcome should also be discussed.

Bi-compartmental or Tri-compartmental Arthritis

Patients with bi- or tri-compartmental arthritis of the knee who have failed to respond to conservative treatment should be considered for total knee arthroplasty ("A" Recommendation). The decision to proceed with total knee arthroplasty is shared by the patient and surgeon, and is based largely on quality of life issues. The choice to proceed with surgery should be based on the patient's age, activity level, occupation and a discussion. The discussion should include the natural history of the underlying condition including short- and long-term pain and physical impairment expectations with and without surgery. The efficacy of the proposed surgical procedure should be discussed. The risks and possible complications of each treatment option and reasonable expectation and timeframe to accomplish the expected outcome should be discussed.

Total joint replacement is contraindicated in the presence of active infection. Good results have been reported in total knee arthroplasty in patients under 55 years of age ("B" Recommendation).

Medial Compartment Arthritis

Young, active patients with varus alignment that have failed to respond to conservative treatment should be considered for tibial osteotomy ("A" Recommendation). Prerequisites for predictable results from proximal tibial osteotomy include: a range of motion of 5 to 90 degrees or greater, maintenance of some articular cartilage medially, minimal involvement of the lateral and patellofemoral compartments, and no more than minimal instability or lateral subluxation.

Patients who are less active may be considered for unicompartmental arthroplasty of the medial compartment of the knee ("B" Recommendation). Pain should be well localized to the medial compartment, and radiographs should demonstrate minimal involvement of the lateral and patellofemoral compartments. Reasonable

weight and a functionally intact anterior cruciate ligament are associated with favorable outcome.

Patients with predominantly medial compartment arthritis who are not candidates for a tibial osteotomy or unicompartmental arthroplasty may be candidates for total knee arthroplasty ("A" Recommendation).

A discussion with the patient should include the natural history of the underlying condition including short- and long-term pain and physical impairment expectations with and without surgery. The efficacy of the proposed surgical procedure should be discussed. The risks and possible complications of each treatment option and reasonable expectation and timeframe to accomplish the expected outcome should also be discussed.

Lateral Compartment Arthritis

Young, very active patients with isolated narrowing of the lateral compartment may be candidates for a distal femoral varus osteotomy ("B" Recommendation). Distal femoral varus osteotomy is indicated when there is 10 degrees or more of tibiofemoral valgus, particularly when the joint line is oblique.

Patients who are not candidates for a distal femoral varus osteotomy may be candidates for total knee arthroplasty ("A" Recommendation) or, occasionally, unicompartmental arthroplasty of the lateral compartment ("C" Recommendation).

Isolated Patellofemoral Arthritis

Young, very active patients with symptoms and radiographic changes isolated to the patellofemoral joint may be considered for a procedure to elevate the tibial tubercle ("D" Recommendation) or a patellectomy ("D" Recommendation). The role of patellectomy is not well defined and indications are limited. Results of tibial tubercle elevation have been variable with a significant complication rate.

A patient who is not young or very active may be a candidate for total knee arthroplasty ("B" Recommendation). A patellofemoral arthroplasty may also be considered, but the role for this surgical procedure is not well defined and indications are limited ("B" Recommendation).

A discussion with the patient should include the natural history of the underlying condition including short- and long-term pain and physical impairment expectations with and without surgery. The efficacy of the proposed surgical procedure should be discussed. The risks and possible complications of each treatment option and reasonable expectation and timeframe to accomplish the expected outcome should also be discussed.

Alternative Approaches

Continued conservative care for osteoarthritis of the knee may result in continued pain, dysfunction, and limitation in function. This often results in a diminution in quality of life. The avoidance of the risk and discomfort of surgery, for some

patients, is desirable. There is some evidence that a long delay before arthroplasty is performed may result in a slightly poorer outcome, possibly due to worsening of muscle function and joint motion ("C" Recommendation).

Definitions:

Strength of Recommendation

A. Type I evidence or consistent findings from multiple studies of types II, III, or IV

B. Types II, III, or IV evidence and findings are generally consistent

C. Types II, III, or IV evidence, but findings are inconsistent

D. Little or no systematic empirical evidence

Levels of Evidence

Type I. Meta-analysis of multiple, well-designed controlled studies; or high power randomized, controlled clinical trial

Type II. Well-designed experimental study; or low-power randomized, controlled clinical trial

Type III. Well-designed, non-experimental studies such as nonrandomized, controlled single-group, pre-post, cohort, time, or matched case-control series

Type IV. Well-designed, non-experimental studies, such as comparative and correlational descriptive and case studies

Type V. Case reports and clinical examples

Consensus/opinion (as it is used in bibliography of the original guideline): Articles representing expert consensus and not meeting the rigid I-V measurement are noted to represent consensus/opinion.

CLINICAL ALGORITHM(S)

A detailed algorithm is presented in the original guideline document on Universe of Adult Patients with Osteoarthritis of the Knee -- Phase II.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is specifically stated and identified for each recommendation (see the "Major Recommendations" field).

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Successful surgical treatment for osteoarthritis of the knee results in a significant, measurable improvement in quality of life. Arthroplasty procedures are associated with a high short-term and long-term success rate. Patient satisfaction is good; pain and function usually improve significantly. Ambulation is usually significantly improved following successful knee arthroplasty. The ability to kneel and squat may not be improved with total knee arthroplasty.
- Osteotomy procedures may be slightly less reliably successful and afford slightly less pain relief than arthroplasty procedures, but allow a young patient to remain active. This is important for relatively young patients with high occupational or recreational desires for knee function. Osteotomy procedures generally are associated with a significant short-term and medium-term improvement in quality of life.

POTENTIAL HARMS

Risks and complications of surgery

CONTRAINDICATIONS

CONTRAINDICATIONS

Total joint replacement is contraindicated in the presence of active infection

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

This guideline should not be construed as including all proper methods of care or excluding methods of care reasonably directed to obtaining the same results. The ultimate judgment regarding any specific procedure or treatment must be made by the treating physician after a full assessment of all circumstances presented by a patient, including the needs and resources of a particular locality or institution.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

American Academy of Orthopaedic Surgeons. AAOS clinical guideline on osteoarthritis of the knee (phase II). Rosemont (IL): American Academy of Orthopaedic Surgeons; 2003. 15 p. [75 references]

ADAPTATION

The guideline was adapted from the 1996 American Academy of Orthopaedic Surgeons (AAOS) Clinical Guideline on Knee Pain, originally developed by a multi-professional panel led by the AAOS Task Force on Clinical Algorithms in cooperation with the AAOS Committee on Clinical Policies, the American Association of Neurological Surgeons, the American College of Physical Medicine and Rehabilitation, the American College of Rheumatology, as well as individuals in other medical specialties including family practice.

DATE RELEASED

2003

GUIDELINE DEVELOPER(S)

American Academy of Orthopaedic Surgeons - Medical Specialty Society

SOURCE(S) OF FUNDING

American Academy of Orthopaedic Surgeons

GUIDELINE COMMITTEE

American Academy of Orthopaedic Surgeons (AAOS) Work Group

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Revision Panel (1999-2003): Greg Stocks, MD, Chairman; Doug Dennis, MD; J. Wesley Mesko, MD; John A. Cardea, MD; Charles R. Clark, MD

Original authors (1996-1999): Aaron Rosenberg, MD, Chairman; Steven F. Harwin, MD; Thomas Sculco, MD; Doug Dennis, MD; Don Reilly, MD; Howard

Fuchs, MD; Chuck Bush Joseph, MD; Calvin Brown, MD; Robert Barrack, MD; Ray Wasielewski, MD; Michael Kelly, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available from the American Academy of Orthopaedic Surgeons Web site.

Print copies: Available from the American Academy of Orthopaedic Surgeons, 6300 North River Road, Rosemont, IL 60018-4262. Telephone: (800) 626-6726 (800 346-AAOS); Fax: (847) 823-8125; Web site: www.aaos.org.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Universe of adult patients with osteoarthritis of the knee -- Phase II. Rosemont (IL): American Academy of Orthopaedic Surgeons; 2004. 1 p.

Electronic copies: Available in Portable Document Format (PDF) from the American Academy of Orthopaedic Surgeons Web site.

Print copies: Available from the American Academy of Orthopaedic Surgeons, 6300 North River Road, Rosemont, IL 60018-4262. Telephone: (847) 823-7186; (800) 346-AAOS. Fax: (847) 823-8125. Web site: www.aaos.org.

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on May 3, 2004. The information was verified by the guideline developer on May 13, 2004.

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